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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,501	03/26/2004	Kazuhiro Oki	8012-1240	7886

466 7590 09/19/2008

YOUNG & THOMPSON
209 Madison Street
Suite 500
ALEXANDRIA, VA 22314

EXAMINER	
PADGETT, MARIANNE L	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
09/19/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/809,501	OKI ET AL.	
	Examiner	**Art Unit**	
	MARIANNE L. PADGETT	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _7/16/2008 & 5/27/2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20,42 and 43_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-20,42 and 43_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

1. A **Request for Continued Examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **7/16/2008** has been entered.

Applicants' RCE has entered the after final amendment of 5/27/2008, plus an amendment submitted with the RCE, which corrects nomenclature inconsistency & clarity of scope problems as set forth in the advisory action of 6/9/2008.

While not clarity problems, the examiner notes that only the angle at the entrance is defined to be a "transport angle θ_1", while θ_2 & θ_3 lack the same descriptive nomenclature (may or may not be significant to applicants' intent), and are merely angles of the web present at some guide roller present in the casing & at its exit, respectively, but need not be present for more than an instance/single spot within the claimed location.

The scope of independent claim 1, as amended, is noted to encompass any drying method for any coating solution that employs any organic solvent & is on any web substrate, where transport from the coating station & through a drying mechanism having a casing/housing, which is performed at an inclination , with the initial (entrance) angle being the steepest & between angles 60-90°, inclusive of the 90° end points, where that inclination employs at least two angles, that may be only different by 1°, as it is possible for either $\theta_2 = \theta_3$ or $\theta_2 = \theta_1$, i.e. the process may read on $\theta_2 = \theta_1 = 90°$ & $\theta_3 = 89°$, or $\theta_2 = \theta_1 = 61°$ & $\theta_3 = 60°$, or $\theta_2 = \theta_1 = 90°$ & $\theta_3 = 60°$, etc. Note that a guide roller at an exit that pivots the direction of the film from 90° to horizontal will go through the angle 60°, or a guide roller at an entrance will include points where the web is being transported having various angles dependent on the radii over which the web contacts a guide roller.

2. **Claim 1** is **objected** to because of the following informalities: in claim 1, line 13, "a casing of the drying device" would now appear to be the same as "a casing" introduced in lines 9-10, however while the limitations terminology is the same, use of the article "a" does not indicate any antecedent basis, thus while these "casings" may be the same, they need not necessarily be the same, so will be treated as including either option, however applicants may wish to clarify their claim language to indicate whether or not either antecedent basis or differentiation was intended. Appropriate correction is required.

3. The following is a quotation of the appropriate paragraphs of **35 U.S.C. 102** that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1-3, 5, 14 & 19-20** are rejected under 35 U.S.C. **102(a)** as anticipated by or, in the alternative, under 35 U.S.C. **103(a)** as being obvious over **Endo et al.** (2003/0131793 A1).

The applied reference has a **common assignee** (Fuji Photo Film Co., LTD, and no overlapping inventors) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Endo et al. teach deposition of solution coatings which may have organic solvents, on a continuous flexible substrate (i.e. web), where the deposition techniques may include use of gravure coaters, bar coaters, extrusion coaters, etc., with illustrated exemplary coating apparatus showing coater 40 having the web supported by a backup roller & in a sub-chamber immediately before the entrance to dryer 42, where the coated side of the web faces away from the support rollers & enters the drying chamber at approximately or close to vertical (i.e. angle ~ 90°). The path through the drying chamber (i.e. casing) is illustrated as having a gradually changing angle, which exits the drying chamber at an angle closer to the horizontal than the preceding angles, &

which appears to be illustrated to be within the claimed range, especially noting as per the discussion in [0049] concerning figures 7 & 8, which show parts of figure 2, that the rollers in passage 104 that are controlling the movement of the web are arranged or aligned vertically, which along with the illustrated coater 40 indicate the vertical orientation of the apparatus. The three-part drying chamber is surrounded by casing device 64; employs multiple backup rollers 78 to support the coated web; and the internal structure of the drying device (figure 5) includes supply-side current plate 84 & nozzle plate 80 on one side of the web & arc shaped suction plate 87 & current plate 90 on the other side of the web. Downstream from all the coating/drying sections, Endo et al. additionally uses heat treatment device 28 that supplies hot-air to the coated substrate which will thus inherently effect further drying if any moisture is left. Particularly see the abstract; figures, esp. 1-2 & 5; [0002-4]; [0008-10]; [0012]; [0015-17, esp. 17]; [0031]; [0033-37, esp. 33-34]; [0040-44, esp. 41 & 44]; and [0049].

Alternatively, while the figures of Endo et al. would appear to meet the claimed angle criteria required by applicants' claims, there is no explicit discussion of the angles employed in the illustrated apparatus configuration, and the figures need not necessarily be to scale, however given that the figures do appear to be illustrated within the claimed angular ranges, Endo et al. discusses the importance of preventing drying faults, such as unevenness induced by when drying via the use of their encased multi-zone drying device, may be considered to specifically discuss the arc shaped path via discussion of the backup roller, arc shaped plate configuration with in the dry air, etc., where the resultant laminar flow & overall structure is suggested to prevent disturbance of the drying air which induces faults, so it would've been further obvious to one of ordinary skill in the art to employ the configurations & proportions as illustrated, at least for initial routine experimentation/testing of the structure in order to produce the taught laminar flow characteristics in the drying zones so as to produce the taught results, where maintaining the illustrated vertical configuration angular relationships would have been reasonably expected to do

so & to be further advantageous, as it would have provided spatially efficient arrangements (i.e. more efficient use of factory floor space than spreading out horizontally).

5. **Claims 4, 6-8, 15-16, 18 & 42-43** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Endo et al.** (793), as applied above over claims 1-3, 5, 14 & 19-20.

Endo et al. is to generic solution coatings deposition & drying, and does not provide any specific parameters with respect to parameters, such as speeds, distances between components in the apparatus, size of substrate, thickness of coating, percentages of solution, however they do provide relative teachings that their apparatus & techniques are capable of producing **multilayer** coating films with **small film thicknesses**, without adherents of dust or drying faults induced by wind drying or level variations or streaks ([0008]), where it is taught to individually set drying zone conditions corresponding to a film surface strength, etc. (i.e. optimize for specific materials' characteristics), & taught that the kinds of coaters & kinds of solutions useful in the process are varied or differ, but still expected to be effectively dried ([0016-17]), hence it would've been obvious to one of ordinary skill in the art to optimize parameters of a process dependent on coating materials & substrates to be employed, in order to effect taught results. In other words, as distances between guide rollers will depend on various factors, such as the substrate size & strength, coating apparatus size, etc., so that inter roller distances would have been chosen accordingly, with it further noted that one of ordinary skill in the art in viewing the illustrated compact configuration of the coating device immediately preceding the drying device in figure 2, would have expected that the inter roller distances in such a device would have been considerably less than the maximum values as claimed unless the substrate & coating apparatus were truly humongous. For example, a 2 cm wide web & 5 feet wide web would have been expected to have proportionately different spacings, further dependent on the strength of the substrate materials & apparatus structural characteristics necessary to handle substrate dimensions & degree of flexibility or rigidity. Note applicants' claims are completely anonymous with respect to any

characteristics which would define requirements for the distances, thus failing to give any context that may provide critical meanings therefore.

With respect to solvent percentages, the Endo et al. teachings suggest an expected effectiveness for coating solutions not limited by the percentage of solvent, such that the claimed broad range of at least 50% by mass of solvent would have been expected to be effectively treated. Similarly, while not teaching the specific percentage of solvent removed, the reference teaches individualized control for zones & coatings, which would reasonably have been expected to lead one of ordinary skill in the art to optimize the degree of drying in each drying zone of the dryer in order to achieve the degree of drying required for the particular process. As the speed of transport creates a component of wind in the dryer enclosure, it would've been obvious as a matter of competent workmanship & common sense to one of ordinary skill in the art, that it would have been necessary to optimize speed combined with the dryer airflow employed to achieve the taught laminar flow in the dryer, and thus the objective of preventing winded induced faults in the coating. Endo et al' s relative teaching of multilayer coating films with small thickness, with explicit showing of an exemplary figure 1 device having five layers in the multilayer coating film, which is described to have an overall "small thickness", while using relative terminology, would have suggested to one of ordinary skill in the art that it would've been obvious for each of those multilayer films to be a thin film (or the overall would not be likely to be described as small thickness), and "thin films" are characteristically inclusive of thicknesses as claimed, such that producing dried layer thicknesses of ≤ 50 µm would have reasonably been expected to be both desirable & effectively produced by the taught coating process.

With respect to the specific dryer maximum entrance & minimum exit angles of 89° or 88°, & 75°, respectively, 89 & 88° are so close to vertical (90°) to be essentially included by approximately vertical that one of ordinary skill in the art would reasonably have expected them to be encompassed by the illustrated approximately vertical configuration or its alternative

obviousness as discussed above. The claimed minimum exit angle of 75° is reasonably within configurational dimensions/relationships as suggested by Endo et al.(793)'s illustrations, that it would have been reasonably expected to be effectively employed in dryer configurations as taught have been required to laminar flow characteristics.

6. **Claims 1-9, 11, 14-20 & 42-43** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Cohn** (3,965,851), in view of **Strobush et al.** (5,881,476), optionally considering **Aoki** (2002/0031608 A1).

Cohn teaches coating latex sealing or adhesive material on flat portions of sheets, papers bags or the like, where the process is particularly exemplified for envelope flaps. Cohn teaches using an apparatus configuration where the substrate material to be coated is loaded & unloaded on the same side of the apparatus for the advantage of efficiency, where the substrate material is supported & conveyed using a system of continuous belts & multiple rollers, and where this process has a configuration in which coating deposition occurs immediately before entrance to the dielectric dryer, which is the encased by housing 98, with a plurality of 3 inch diameter rollers 94 supporting the conveyor belts holding the substrate material with the coating being dried. As the support rollers in the dryer are illustrated as being approximately equidistant & approximately separated by a length equal to their diameter, while no specific roller separation is taught, this configuration along with the teaching of 3 inch diameters would have suggested approximately 3 inch spacings as a reasonable starting point for apparatus configuration to one of ordinary skill in the art due to the illustrated geometry, where variation with respect to optimization for conveyor belt characteristics & physical requirements would've been expected, but thus reasonably suggestive of roller spacings as claimed. Note that given conventional dimensions of envelopes illustrated to be used with apparatus & that the distance from the coating nip between the impressed roller 82 & latex applicator 88 is approximately the same with as illustrated envelopes, the distance from the coating rollers to the dryer entrance would have been expected to be less

than a foot. While Cohn does not discuss angles of the transported substrate within the dryer & it's housing with respect to horizontal, they note that the angle made by the axis of rollers 82 & 88 is approximately 45° with respect to the horizontal (to provide maximum belt tension), and the examiner notes that the illustration, as seen in figure 8, is dimensionally consistent with this teaching, thus providing an expectation of reasonably meaningful geometric or angular relationships therein. As illustrated in figure 8, the coated material conveyed on outer belt 34 would enter the dryer at an angle just less than vertical (as illustrated, expected to be slightly less than 88°), with the angle gradually changing as the substrate material traverses the dryer, and where the tangent to the conveyor means at the exit to the dryer appears significantly greater than 45° to the horizontal, suggesting that the illustrated angular dimensions are reasonably within those claimed by applicants, or that it would've been obvious to one of ordinary skill in the art to determine optimum & effective transport angles through the dielectric dryer of Cohn based on the taught & illustrated configurations, such that claimed minimum is of 60° or 75° for the exit angle would have reasonably been expected to be suggested or derived therefrom, & effective for the process. Particularly see the abstract; the figures, esp. 2, 5 & 8; col. 1, lines 5-15 for general use & line 45-col. 2, line 15 for prior art disadvantages concerning problems with beading during drying (i.e. drying faults) & inefficient load/unload arrangements; col. 2, lines 39-54 for Cohn's process's greater drying rate & load/unload efficiency; col. 3, lines 1-59 for process generalizations; col. 4, lines 30-45; col. 6, especially lines 1-6 & 30-col. 7, line 47; col. 8, lines 10-15, that indicate use of the dryer 98 leaves the latex or adhesive substantially dried, which may reasonably be considered to encompass the requirement that at least 70% by mass of the solvent is removed, or it would not have been considered substantially dried.

While Cohn teaches application & drying of what are clearly organic solutions, there are no teachings of what solvent is being evaporated from the latex or adhesive deposited, i.e. whether or not the solvent is organic. However, it would've been obvious to one of ordinary skill

in the art to employ solvent(s) effective for enabling deposition of the particular latex or adhesive being deposited, whether that's solvent was aqueous, organic or a combination of such solvents, it would have required drying as taught & have been expected to have been effectively dried via Cohn' s technique.

Also, while the introduction discusses the possibility that flat sheets may be coated with the sealing material (col. 1, lines 5-10), which might be considered inclusive of continuous sheets, all the examples are to coating of discrete envelope flaps. However, it is old and well known in the art to treat continuous sheet substrates = web substrates, with equivalent manufacturing techniques, dependent on whether discrete sheets or continue a sheets or more convenient at a particular stage of processing or for a particular enduse. Advantages taught by Cohn with respect to drying applied solution coatings would have been expected to be equally effective for discrete or continuous substrate sheet material, while efficiencies due to close proximity of load/unload sites would have been expected to be similar whether loading/unloading batches of discrete sheets (envelopes, etc.) to be continuously fed or rolls of sheet material, as the continuous processing effect would have been expected to be analogous.

Strobush et al. (5,881,476) provide examples of continuous processing of substrate material supplied & collected on rolls (ref #24 & 29 in figure 5), that have been coated with solutions that require drying, including organic solutions, such as polymeric resins in organic solvent (col. 2, lines 1-19, esp. 9), where similar concerns with the quality of the dried product (teach control of air movement to prevent turbulence which results in mottle) as expressed in Cohn (avoiding beading of latex or adhesives) are related to effective coating/drying procedures. The teachings of Strobush et al. support the above stated obviousness of both continuous roll versus batch of discrete sheets, and of drying organic solution coatings that employ organic solvents. Furthermore, considerations for processing procedures relating to various process parameters & considerations with respect to alternative particular enduses besides envelopes, as

previously discussed with respect Strobush et al., would have been expected to be relevant to the techniques of Cohn, as Strobush et al. provides further means to regulate & control the process in order to improve the quality of the dried coating, which may be equivalently employed for control in Cohn for their taught purposes with reasonable expectation of effectiveness due to analogous coating procedures & enclosed drying oven requirements, noting that even with the use of a dielectric heater as in Cohn, having continuous movement through a dryer housing will affect air flow thus defects that may be caused thereby unless appropriate conditions are employed.

As previously set forth, Strobush et al. teach a process and apparatus (figures 5-12 & 23) for drying coatings on the substrate, where the coatings may be comprised of solid material dissolved, dispersed or emulsified in an evaporable liquid vehicle (e.g. solvent, inclusive organic solvents), where their process is particularly directed to minimizing the recognized problems caused by air turbulence, such as defect formation like mottle, that are known to increase with increasing velocity of drying gas, via minimizing disturbance of gas adjacent to the coated side of the substrate. A drying enclosure (17) is employed with configurations within designed to minimize mottle, where the first drying zone (18) is said to be of primary importance, and employs drying gas (e.g. heated air or inert gas) supplied from below the substrate, where it's coated surface is face up, with exhaust ports above & below the substrate, which collect evaporated solvent in plenums, and with independent control of temperature & gas velocity of individual drying gas inputs making possible the creation of subzones within the first drying zone (zones may or may not be partitioned) & control of the solvent level within the drying enclosure. It is further taught that the drying gas may <u>be replaced by or augmented by use of other individually controllable heat sources</u>, such as heated rollers, IR heaters, or <u>heated plates</u>, thus is consistent with dielectric heating options as taught by Cohn, providing further motivation for the combination with Strobush et al., including combination of heat sources.

The drying process is taught to be controlled to prevent or minimize mottle formation by keeping the heat transfer rates below a threshold for causing mottle, where as a particular coating is dried, it will eventually reach a point at which it becomes "virtually mottle-proof", after which the heat transfer rates can be significantly increased.

The figures illustrating the apparatus, particularly figure 5 or 23, show the **coated substrate (web) being transported upward**, immediately after coating, where rollers are illustrated to have an additionally steep upward incline, thus is recently consistent or analogous to the coating configuration as set forth in Cohn. The path for drying a Strobush et al. is in a gently inclined arc that can be said to be "towards a horizontal direction gradually", as the arc is tangent to horizontal, but Cohn provides reasons as discussed above for damages of employing the 60°-90° inclination immediately after coating & during drying. Furthermore, Strobush et al. also note that other path shapes may be employed, providing further motivation for combination with Cohn. A variety of thin film coating techniques requiring drying as taught are mentioned, inclusive of forward or reverse roll coating, wire-wound coating, blade coating, slot coating, slide coating, curtain coating, etc. (note slot coating is inclusive of extrusion die coating, while roll coating is inclusive of gravure & wire-wound coating ≡ wire-bar coating). In Strobush et al.'s example 1, 2 coating layers are applied via coating **die** (≡ extrusion coater) simultaneously, which both employ organic solvents of 2-butanone & methanol, in weight percentages greater than 50% (col. 18, line 45-col. 19, lines 23), where the wet thickness of the emulsion layer is 81.3 μm, while the wet thickness of the topcoat is 19.1 μm (col. 19, lines 24-53), noting the topcoat reads on applicants' claimed thickness. Various drying conditions were applied to determine their effects on mottling (col. 20). The examples on cols.18-21, were noted to only be exemplary, and employed different process speeds (0.38, 0.508, or 0.127 m/s) & distances between coating and entrance into the dryer (4 or 3 m), where example 4 teaches in col. 21, lines 43- 46, that the

atmosphere is inert gas and the partial pressure of the solvent could be controlled using a "condenser loop".

It is noted that while Strobush et al. do not mention "an extrusion die coater" or a "wire bar coater" by name they specifically use die coaters & mention either equivalent names or general categories of these types of claimed coaters such that the taught useful techniques are considered inclusive of those claimed, or alternately would have been expected by one of ordinary skill in the art to be effectively treated by the drying process of Strobush et al., as they all may employ coating materials containing solvents as claimed, where the process of Strobush et al. is not dependent on the particular solution/solvent containing material application process.

In Strobush et al., particularly see the abstract; col. 1, lines 15-50 & 67-col. 2, lines 60; col. 6, lines 21-51+; col. 8, lines 64-col. 9, lines 59, especially 1-8, 13-15, 20-48; col. 10, lines 1-10, 29-39 & 52-col. 11, lines 27 & 38-48; col. 12, lines 14-67+; col. 13, lines 34-38; col. 14, lines 15-35; col. 15, lines 16-30+; col. 16, lines 14-25, 40-48 & 55-61)

The examiner continues to note, that when the apparatus of Strobush et al. is turned off, those the transport of the web must inherently be stopped, as would the input of drying gas also be stopped, hence the velocity thereof would have been be zero.

With respect to alternative coating techniques & Cohn + Strobush et al., it remains noteworthy that one of ordinary skill to employ inclinations in a range around those approximating illustrated configurations, which would have been expected to be inclusive of claimed angles, where specific choice would have very depended on particular coating techniques, coating materials & their properties, such as viscosity, etc., especially considering the teachings of the expected usefulness of a variety of coating & drying apparatus to which the principles they set forth for drying while minimizing the creation of drying induced defects such as mottle, would apply (col. 8, lines 64-col. 9, lines 18).

While the exemplary distances between the start of the drying device & the coater provided in the specific examples of Strobush et al. (note illustrated guide roller at entrance of drying device) are longer than the claimed distances of "less than 2m" or "within 0.7m", it would have been obvious to an ordinary skill in the art that the particular examples of distance in the exemplary processes were not limiting to Strobush et al.'s process & apparatus structure, especially when considered with Cohn, and since Strobush et al. do not place limits thereon in their general discussion & employ varying short distances in the examples, thus one of ordinary skill in the art would have found it obvious to employ such distances as taught or shorter distances, dependent on local conditions, materials being processed, and keeping in mind the teachings of Strobush et al. with respect to the importance of the initial drying zone in preventing defect formation (mottling) in the coating, hence would have been expected to recognize that the sooner (i.e. shorter distances, dependent on speed) the coating is enclosed in the controlled drying environment, the sooner it is protected from environmental effects that could cause defects, thus suggesting to one of ordinary skill & competence, the obviousness of employing distances as claimed. Also note that guide roller intervals within Strobush et al.'s dryer are not discuss, however are considered obvious variations on the illustrated configuration, as they would have been expected to be configured so as to adequately support the coated web substrate, thus would have depended on the dimensions & material of the web, so reasonably have been expected to be inclusive of less than 2 m, and further considering that the guide rollers may be heated rollers as were taught for possibly providing heat or augmenting the heated drying process, and thus would have been positioned to adequately provide the individually controlled subzones, which has noted in col. 14, lines 15-25, were contemplated to include those down to infinitesimally small size, thus suggestive of space as claimed for heated guide rollers.

Optionally, **Aoki** (abstract; figures 3 & 5; [0002-4]; [0009-11]; [0027-28, esp.28]; [0031]; [0034-35] & [0038]) is also concerned with the effect of turbulence on a coating that is to

be dried, and supports the above contention that the time before entering the drying zone & turbulence that may be present between coating and drying can be critical to the results of the drying, where they teach that the time after coating prior to entry into the drying zone should be no more than five seconds, preferably no more than three seconds, where the speed of the support is preferably between 0.5 and 1000 m/minute (i.e. maximum of 18 m/sec). The timing considerations as explicitly set forth by Aoki are consistent with timings which would have been expected for the compact configuration as illustrated in **Cohn**, where do you provide is a reason why such timing is important not just to efficiency, but also to quality. It would've been obvious to one ordinary skill in the art to apply the teachings Aoki to those of Cohn + Strobush et al., as they are directed to complementary considerations with respect to drying, plus, as illustrated in figures 3 & 5, are considered with respect to analogous coater & dryer configurations that employ gradual changes in inclination towards the horizontal within the drying device. It has noted that all the speeds employed in the examples of Strobush at all are within the speeds preferred by Aoki, where it is noted that for the preferred 3 second maximum for entering the dryer combination with Strobush et al.'s example 4, would give 3s(0.127 m/s) = 0.371 m, thus substantiating above arguments. It is further noted with respect to the configurations as illustrated in figures 3 & 5 of Aoki that the coating device (configured like an extrusion coater as in Aoki's figure 1, [0028]), applies the coating at a vertical orientation of the web, which as it leaves the coater via action of the opposing guide roller immediately leaves vertical to be almost vertical such that it would go through angles as present in new claims 42 & 43, and proceed gradually upward at an inclination as presently claimed, which becomes more gradual & arced analogously to illustrations in the primary reference as it enters & within the dryer. Given the similarities of these configurations, plus the above observations concerning the wide applicability of different coating techniques to Strobush et al.'s drying process, it would've been obvious to employ coating configurations as illustrated by Aoki for the coating techniques of Strobush et al.,

thus also providing cumulative motivation, support for the above arguments & reasons for obviousness with respect to the claimed angles of inclination.

While neither Cohn nor Strobush et al. teach recovering condensed organic solvent, the suggestion in Strobush et al.'s example 4 of employing "a condenser loop" to control the pressure of evaporated solvent is suggestive of the solvent being collected, and it would have been obvious to one of ordinary skill in the art that as one is already employing this means, which will collect the solvent, to also recover that solvent, especially for organic solvents for which there are environmental regulations concerning required recovery thereof (i.e. prohibiting release into the environment), which would provide ample motivation to recover such collected/condensed solvents. Note Strobush et al. teach subzones for drying, that may be partitioned, it would be have been expected by one of ordinary skill in the art as the condition to each subzone are individually controllable, to have the taught condensers in each zone.

While Strobush et al. does not discuss a particular range of weight percentages, such as applicants' claimed "at least 70% by mass", for the degree of drying that takes place in their apparatus, their discussion which requires the initial drying, such as in the first zone, to dry the coating sufficient to the evaporated enough solvent that the coating becomes "virtually mottle-proof", would have been expected by one of ordinary skill in the art to be inclusive of claimed percentages for a great many coatings, noting that what percentage of solvent needs to be removed to reach the state would have been at least partially dependent on the properties of the individual coating materials, but would have been expected to be sufficient for the coating to have "set", thus reasonably inclusive of having a fairly small value of solvent remaining, such as less than 20% by weight. It is further noted that the particular percentage required in claim 16 is fairly meaningless with respect to significance to the process, as it requires that "...dries at least 70% by mass of said organic solvent contained in said coating solution", where since one has no idea what the original amount of solvent was, there is no way to determine how much 30% or less

of an unknown amount constitutes, nor can this unknown amount have any clear meaning with respect to effects on the coating, etc., i.e. with respect to the potential for forming undesirable defects.

7. **Claims 10 & 12-13** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Cohn**, in view of **Strobush et al.** (476) & optionally **Aoki** (2002/0031608 A1) as applied to claims 1-9, 11, 14-20 & 42-43 above, and further in view of **Reznik** (4,694,586).

While Strobush et al. as combined with Cohn above, does not provide any details on the structure of the solvent condenser loop used to control the pressure of solvent in the dryer atmosphere, solvent condensers employed in dryers are old and well-known, as exemplified by **Reznik,** who teaches that his technique is useful for both maintaining the solvent vapor content of the atmosphere, plus condensing & recovering solvent dried from a coating, where the requirements for this procedure include the space in the dryer being a confined space of limited volume, and where cooling means, such as cooling coils that may be in a wall used for condensation, or cooled walls of the drying space, are employed to condense excess vapor in the atmosphere, which runs down the wall due to gravity, to be recovered in a collection tray (abstract; figures, esp. 1-2 & 5-6; col. 1, lines 15-23 & 55-62; col. 2, lines 7-25, 47-52 & 58-66; col. 3, lines 1-8 & 57-65; col. 4, lines 13-18 & 25-45; col. 5, lines 14-25 & 39-53; col. 6, lines 20-30 & 56-66). Giving that the condensing apparatus employed in the dryer of Reznik may be used for the stated purpose desired in example 4 of Strobush et al., it would've been obvious to one of ordinary skill the art to apply the teachings of condensation/solvent vapor pressure control to the drying apparatus of Strobush et al., with the expectation of effectively controlling solvent vapor pressure as desired, since both drying apparatus are dealing with housings creating limited confined spaces. Furthermore, recovering evaporated solvent, via such a recovery operation would have been motivated for reasons as stated above & as given in Reznik. It is further noted that use of planar surfaces for the cooled condensation recovery surface, would have been

consistent with the illustrated structure of Strobush et al. as combined with Reznik for the condensation/solvent recovery means, hence would have been found by one of ordinary skill in the art to be an obvious adaptation of Reznik's teachings to the Strobush et al. process, where such planar surfaces would have read on the claimed "plate-like member".

8. Is noted that with respect to Hashimoto et al. (JP 2003-133160 A), as the limitations of both claims 45 & 46, with clarification with respect to the horizontal have been placed in the independent claim, he won a 2 rejection has been moved, since the exit angle from the drying chamber approaches horizontal, i.e. is not ≥ 60°, however the angles for entrance & passage through the drying furnace (6) remain relevant & are noted to be consistent with Cohn's configuration, however any combination thereof with is redundant at this time for the claims as presently written.

In Hashimoto et al., see the English abstract & figure 1, noting gradual incline of coated surface in drying furnace 6, employing multiple rollers, then going horizontal upon exiting the furnace, for relevant configurations, angles & angular relationships.

9. Other **art of interest** includes: Endo et al. (7,182,813 B2), which is the patented version of Endo et al.'s PGPub 2003/0131793 A1 & is noted to have only apparatus claims; Sonobe et al. (2008/0206455 A1), to the same assignee & including apparatus illustrations that are in significantly different from those illustrating apparatus used in the present method, however the unexamined/unamended method claims, while two overlapping subject matter of drying an organic solvent coated "band-shaped flexible substrate" = web, does not have limitations directed to the physical configuration, thus at this time is not of interest for double patenting issues.

As previously noted, the patent to Su et al. (6,824,828 B2) is of interest for its comments in col. 1, lines 55-60 concerning stringent regulations regarding recovery of solvents. Other art having further coater & dryer configurations related to the claims include Cabelli (5,814,376:

figures 29-31; col. 22, lines 61-col. 24, line 14 concerning gravure coating); Tsuda et al. (4,223,052); and Yamazaki et al. (5,536,535: figure 2).

10. **Applicant's arguments** with respect to **claims 1-20 & 42-43** have been considered but are moot in view of the **new ground(s) of rejection**.

11. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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/Marianne L. Padgett/
Primary Examiner, Art Unit 1792

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9/15-17/2008